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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/675,374	09/30/2003	Thomas McNulty	125640-1	5988

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GENERAL ELECTRIC COMPANY
GLOBAL RESEARCH
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EXAMINER	
ZIMMER, MARC S	
ART UNIT	**PAPER NUMBER**
1712	

DATE MAILED: 01/20/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/675,374	MCNULTY ET AL.	
	Examiner	Art Unit	
	Marc S. Zimmer	1712	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *09/30/03 and the interview of 01/18/06*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-33* is/are pending in the application.

4a) Of the above claim(s) *16* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-15 and 17-33* is/are rejected.

7)☒ Claim(s) *19 and 30* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *09/30/03,09/27/04*.
4) ☒ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

Election/Restrictions

Restriction to one of the following inventions is required under 35 U.S.C. 121:

I. Claims 1-15 and 17-33, drawn to a composition, product obtained therefrom, and process of using the same, classified in class 524, subclass 588.

II. Claim 17, drawn to a casting investment mold, classified in class 164, subclass 361.

The inventions are distinct, each from the other because of the following reasons:

Inventions I and II are related as mutually exclusive species in an intermediate-final product relationship. Distinctness is proven for claims in this relationship if the intermediate product is useful to make other than the final product (MPEP § 806.04(b), 3rd paragraph), and the species are patentably distinct (MPEP § 806.04(h)). In the instant case, the intermediate product is deemed to be useful for making thermal interface sheets and the inventions are deemed patentably distinct since there is nothing on this record to show them to be obvious variants. Should applicant traverse on the ground that the species are not patentably distinct, applicant should submit evidence or identify such evidence now of record showing the species to be obvious variants or clearly admit on the record that this is the case. In either instance, if the examiner finds one of the inventions anticipated by the prior art, the evidence or admission may be used in a rejection under 35 U.S.C. 103(a) of the other invention.

Restrictions of this type are usually reserved for products related through a chemical process. That is, the final product is obtained from the intermediate product

via further chemical transformation. It can be said that the claimed composition is, in fact, related to the mold in this manner insofar as formation of the mold involves (i) crosslinking the composition and a heating stage(s) that results in the degradation of the crosslinked polymer material.

It is acknowledged that the product of claim 16 is, likewise, derived from the claimed composition but the product of claim 16 is, in the Examiner's estimation much more general in scope and was likely to have been found in any document that taught the process of claim 28. (The Examiner had actually entertained making claims 28-33 a third restrictable group but these claims are related to claims 18-27 as a combination-subcombination and it could not be demonstrated that the combination did not require all of the particulars of the subcombination.) Indeed, the product of claim 16 is basically anticipated by any document that teaches the high-temperature degradation of the ceramic powder-filled, addition-crosslinked siloxane polymer because the "core" has no dimensional limitations attached to it. Incidentally, Applicants clearly distinguish the manufacture of an investment casting core from an investment mold in their Specification.

Because these inventions are distinct for the reasons given above and have acquired a separate status in the art as shown by their different classification, restriction for examination purposes as indicated is proper.

During a telephone conversation with Peter Hagerty on January 18, 2006 a provisional election was made with traverse to prosecute the invention of group I, claims 1-15 and 17-33. Affirmation of this election must be made by applicant in replying to

this Office action. Claim 16 is withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.

Claim Objections

Claim 19 is objected to because to say that "mixing" is "free of a solvent" is awkward. It is submitted that Applicant might consider replacing "free" with "performed in the absence of".

Claim 30 is objected to because it is not clear when the manipulated set forth therein is to be carried out. Applicant should specify when precisely in the process of claim 28 the step of claim 30 is completed.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 1-15 and 17-33 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The manner in which Applicant describes the materials from which the green product is made is such that there appears to be a suggestion that the monomers/oligomers must possess both silicon-bound alkenyl moieties and silicon-bound hydrogen atoms. From claim 1:

"monomers and/or oligomers.... contain an alkenyl reactive functional group and a hydride reactive functional group."

From claims 18 and 27:

"wherein the silicone monomers and'or oligomers contain an alkenyl functionality of formula... and a hydride functionality consisting of silicon-hydrogen bonds."

Taken in the larger context of the entire disclosure, however, it seems evident that this is not, in fact, the case. Rather, there must be at least one monomer/oligomer bearing alkenyl groups and a least one monomer/oligomer bearing silicon-bound hydrogen atoms. It is further contemplated that in one embodiment there may be a single molecule to which both types of reactive group are attached. In that instance, more than one monomer/oligomer is not needed. For the purpose of evaluating the claims against the prior art, it has been presumed that no one molecule has to be the source of both the alkenyl groups and the silicon-bound hydrogen. Indeed, there would not be proper antecedent basis in claims 1, 18, and 27 for some of the subject matter recited in the dependent claims were it stipulated that moth reactive groups be contained in the same molecule.

Also, in claims 18 and 27, Applicant characterizes the variable "X" as being a divalent hydrocarbon radical where there can be between 0 and 8 of said divalent hydrocarbon radicals. It is unclear why there would be more than one divalent radical- if there were more than one divalent radical, they would have to be strung together head-to-tail so as to make simply a larger divalent radical so it seems that the subscript "a" should be limited to zero or 1.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-5, 8-14, 17-19, 21-25, 27-28, and 30-33 are rejected under 35 U.S.C. 102(b) as being anticipated by Mine et al., U.S. patent # 4,269,753. Mine discloses a ceramifiable composition comprising all of the materials disclosed in the paragraph bridging columns 1 and 2 where component (B) is equivalent to the linear, alkenyl group-functionalized polydiorganosiloxane contemplated in claims 10 and 11. (In column 3, it is stated that the viscosity of this component is between 10 and 100,000 mPa·s. A viscosity is not disclosed of component (C), the organohydrogenpolysiloxane but the skilled artisan will appreciate that these compounds typically have a low degree of polymerization and, therefore, are low in viscosity. Indeed, there are only 18 repeat units in the organohydrogensiloxane portrayed in Example 1. The ceramic fillers (column 4, lines 20-35), which are preferably used in amounts corresponding to 5 to 100 parts by weight (column 4, lines 38-41) but may amount to as much as 300 parts by weight (column 2, line 10) include several of those mentioned in claim 5.

Concerning claim 12, because similar base materials and crosslinking agents are contemplated by both the claims and the reference, this limitation will be inherently satisfied

As for the process claims, curing and ceramer-forming conditions are briefly contemplated at the top of column 5. Concerning claims 19, 30, and 32, organic solvents are identified as an optional component (column 5, lines 44-45) and it will be understood by the skilled artisan that materials can be formulated as a solution or neat.

The highest operating temperature expressly mentioned by this disclosure is 850° C, which the Examiner believes is too low for sintering, thus it would seem that claim 29 is NOT anticipated by the reference.

Claims 1, 3-5, 8-9, 11-12, 16, 18, 21, 23-25, 28-29, and 32-33 are rejected under 35 U.S.C. 102(b) as being anticipated by Atwell et al., U.S. Patent # 4,888,376. To echo the title of this patent, Atwell discloses curable organopolysiloxanes filled with silicon carbide powder and densified sintered bodies therefrom. The general approach by which the sintered bodies are obtained is taught in the paragraph bridging columns 1 and 2. The molded bodies are prepared employing any of the techniques mentioned in column 3, lines 12-15. A description of appropriate organosilicon host polymers is provided in column 3, line 46 to column 4, line 42. Peroxide curing agents are disclosed in column 5 but so are platinum catalysts "when the organopolysiloxane contains both vinyl groups and hydrogen groups" (column 5, lines 47-50). By this, Atwell, apparently means where there is at least one organosiloxane containing alkenyl groups and at least one organohydrogensiloxane. Indeed, Example 5 teaches the preparation of a composition comprising a vinyl group-functionalized siloxane featuring a specified mol fraction of phenyl-, methyl, and phenylvinyl-substituted repeat units, a trimethylsiloxy-terminated methylhydrogensiloxane polymer that is subsequently crosslinked in the presence of silicon carbide powder and a platinum catalyst at 130° C. Thereafter, the bars were fired to provided densified materials.

Claims 1-5, 9, 11-13, 17-19, 21, 24, 28-29, and 31-33 rejected under 35 U.S.C. 102(b) as being anticipated by Schilling et al., U.S. Patent # 5,162,480. Schilling

teaches the preparation of siloxane oligomers bearing both alkenyl substituents and hydride substituents adhering to the general formula disclosed at the bottom of column 2. These materials are said to be self-curing. The intent of the invention is prepare these materials using an equilibration polymerization approach, add a ceramic powder where desired (column 6, lines 30-35) and carry out ceramerization of the composition using a ramped temperature program. See Examples 1 and 2. Although there is no platinum catalyst mentioned, the oligomers are apparently crosslinked anyway during the baking process as indicated by Applicant's characterization of them as self-curing. It is the Examiner's position that the sintering step recited in claim 29 is achieved during the second heating program disclosed in Example 2. It is further notable that various requirements of the oligomers recited by the claims are satisfied by the oligomer depicted under the heading of Example 1.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 6 and 7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mine et al., U.S. patent # 4,269,753.

As for claim 6, Mine states that the ceramic powders mentioned therein may be used in combinations. Further, there are only approximately 25 fillers mentioned thus the skilled artisan could readily envisage, for example, a composition comprising

magnesium oxide, silicon nitride, boron nitride, glass, etc. with magnesium silicate, alumina, or one of the other powders reflected in claim 6 that is contemplated by the reference.

As for claim 7, Table 1 outlines several exemplary compositions wherein the amount of filler used is either 25 or 50 parts based on 130 parts of the organic materials. It is understood, nonetheless, that the preferred range includes up to 100 parts relative to the same amount of polymeric materials. In these instances, it is the Examiner's position that the limitation of claim 7 is inherently satisfied in view of the comparatively larger densities of the inorganic materials.

Claims 2 and 31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Atwell et al., U.S. patent # 4,888,376. Atwell does not disclose a favored ratio of silicon-bound hydrogen groups to alkenyl groups. Nevertheless, it is certainly within the capability of one having ordinary skill in the art to adjust the ratio of these moieties as a matter of routine experimentation to optimize the extent of crosslinking which, of course, has implications for a number of properties of the green product. "Discovering an optimum value of a result effective variable involves only routine skill in the art." *In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980). Furthermore, it shall be noted that the stated ratio is consistent with that offered by nearly every known reference teaching an hydrosilylation-curable silicone composition.

Claim 20 is rejected under 35 U.S.C. 103(a) as being unpatentable over Mine et al., U.S. patent # 4,269,753, Atwell et al., U.S. patent # 4,888,376, and/or Schilling et al., U.S. patent # 5,162,480. Though not expressly described by these documents, the

practice of adding dispersing aids to facilitate the compounding of fillers into a host polymer matrix is ubiquitous in the prior art and is, therefore, obvious. "It is prima facie obvious to add a known ingredient to a known composition for its known function." *In re Lindner* 173 USPQ 356; *In re Dial et al* 140 USPQ 244.

MacDougald et al., U.S. Patent # 6,648,645 also appears to bear some relevance on the claimed invention but is, for the time being, not cited in the name of brevity.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Marc S. Zimmer whose telephone number is 571-272-1096. The examiner can normally be reached on Monday-Friday 8:00-4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Randy Gulakowski can be reached on 571-272-1302. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

January 18, 2006

MARC S. ZIMMER
PRIMARY EXAMINER